Space Weather Forecast

Issued on Saturday, 27 April 2024 at 13:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Declining chance of Moderate-class flares and slight chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity is currently Low, with only Common-class flares in the last 24 hours. There are currently nine sunspot regions on the visible disc. The sunspot cluster in the southwest has now rotated beyond the west limb, with a rapidly declining influence on the flare forecast. A region near centre disc has shown significant growth recently, apparently with a new region appearing in the middle of the existing region. An area in the middle of the group is developing some magnetic complexity. Another region in the southwest has shown further development, with a few intermediate spots emerging. A new region has recently rotated around the east limb, although it is difficult to get a detailed analysis at present due to foreshortening. Remaining sunspot regions are all relatively small, simple and stable.

A new Coronal Mass Ejection (CME) has been observed starting around 26/1830 UTC, which emerged from an area in the southeast of the disc. The resulting CME is mostly passing behind and below Earth's orbit, but there is a slight chance of a glancing blow early on Day 4 (30 Apr).

Solar Wind / Geomagnetic Activity: Solar winds have shown the onset of a coronal hole fast wind, perhaps combined with some weak CME influence. Wind speeds started at background levels but rose to become elevated, from around 330 km/s to near 500 km/s. The Interplanetary Magnetic Field has been mostly Moderate, but with some brief Strong peaks between 27/0400-0630 UTC. The north-south component was moderately negative, becoming more variable after 27/0400 UTC. Geomagnetic activity started the period with G1/Minor Storm (Kp 5) intervals between 26/1200-1800 UTC, before declining to be Quiet to Unsettled.

Energetic Particles / Solar Radiation: Solar radiation was at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of Moderate-class flares and a slight chance of Strong flares, this risk decreasing slightly into Day 2 (28 Apr) as the cluster which was in the southwest rotates well away from the limb.

Solar Wind / Geomagnetic Activity: There is a declining risk of further CME arrivals from the sunspot cluster in the southwest as it has now rotated over the limb. There is, however, a new CME which could give a glancing blow early on Day 4 (30 Apr). There is a series of coronal holes in the western disc, with the initial fast wind now having arrived at Earth. Wind speeds are expected to be at elevated levels of 500-550 km/s through much of Days 1 and 2 (27-28 Apr), before gradually declining thereafter, but with some uncertainty in how fast the wind speeds will decline.

Geomagnetic activity is expected to be Quiet to Unsettled for much of the period, but with a slight chance of Active to G1/Minor Storm intervals, mainly on Day 1 due to a combination of fast wind and potential CME influence, and again on Day 4 due to a possible CME glancing blow.

Energetic Particles / Solar Radiation: Solar radiation is likely to remain at background levels, but with a decreasing slight chance of reaching the S1/Minor Radiation Storm threshold, as the sunspot cluster which was in the southwest rotates well away from the limb.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	10	5	1	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	40	40	40
Very Active	R3 to R5 X	No	10	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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